REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Responsive to the rejection under 35 U.S.C. § 112, second paragraph, Claims 1 and 2 have been amended for clarity and now recite beams positioned between the light transmitting windows and supporting each of the light transmitting windows relative to said reaction chamber so as to provide airtightness of the reaction chamber. Moreover, Claim 11 now recites that the length of the reaction chamber in the moving direction is more than twice a length of "the region of the substrate holder." This rejection is therefore believed to be overcome.

Concerning the rejection under 35 U.S.C. § 112, first paragraph, the regions between the adjacent ones of the windows 4a-4h in Fig. 5 are also beams.

According to a feature of the invention set forth in the claims, a driving mechanism linearly moves or swings a substrate holder in a direction parallel to a surface to be processed. This permits the width of the light transmitting window in the moving direction to be made smaller than the length of the substrate or a region of the substrate holder in the moving direction while avoiding unevenness in processing due to shadows of beams supporting the light transmitting window. One can therefore provide a plurality of light transmitting windows. For example, referring to the non-limiting embodiments, a driving mechanism 34 moves a substrate holder 7 in the direction B2 which is parallel to the surface to be processed. Therefore, the plural light transmitting windows 4 have widths smaller than the length of the region of the substrate holder which holds the substrate.

Claims1-5, 8, 9, 11, 16, 17, 19 and 21-23 were rejected under 35 U.S.C. § 103 as being obvious over the Sakuma et al references in view of Hauf and any one of Tolt, Murakami, Miller and Wertheimer. This rejection is respectfully traversed.

Claim 1 recites that a width of each of the light transmitting windows in the direction in which a region of the substrate holder moves relative to the light transmitting window is smaller than a length of the region in the moving direction

Previously explained, the Sakuma et al references disclose a thermal processing system in which a single light transmitting window 68 is supported by a frame member 66 including intermediate frames 72 (Figure 11) so that the pressure on the transmitting window is improved (column 8, lines 19-38 and column 11, lines 17-35). The Sakuma et al references thus fail to disclose a plurality of windows, but instead disclose a single window supported by a frame.

The U.S. patent to Hauf has now been newly cited to teach a plurality of quartz windows in the Sakuma et al references. However, there is no teaching in Hauf of moving a substrate. The Sakuma et al references simply rotate the substrate, and so no teaching in the prior art that the width of such plural light transmitting windows *in the direction in which the region moves* relative to the light transmitting window is smaller than a length of the region *in the moving direction.*

Tolt, Murakami, Miller and Wertheimer were cited to teach linearly moving or swinging a substrate. However, there is no teaching in the art to relate the direction of moving or swinging to the arrangement of plural light transmitting windows, and so no combination of these references teaches the claimed subject matter, including arranging the plural light transmitting windows such that their width in the direction in which the region moves is smaller than a length of the region in the moving direction.

Claim 2 similarly recites that a width of each of the light transmitting windows in the direction in which the substrate moves relative to the light transmitting windows is smaller than a length of the region in the moving direction. Moreover, Claim 2 recites a driving mechanism which linearly swings the region of the substrate holder relative to the light

transmitting windows in a direction parallel to the surface to be processed. The limitation "driving mechanism which linearly swings" is not disclosed in any of the cited references.

To explain, oxygen gas is supplied and the internal pressure of the reaction chamber 5 is held at 70 Pa, and then while the substrate holder 7 is swung, light is emitted from the lamps. By this way, the oxygen gas is directly and efficiently decomposed to produce highly active oxygen atoms. This active oxygen atoms oxidizes the surface of the substrate to be processed, thereby forming an oxide film (SiO_2 film) on the substrate uniformly. (See the specification of the present invention, page 20, line 24 to page 21, line 9.)

The uniformity of the oxide film was $\pm$ 70% without any swing, and was improved to $\pm$7% when the substrate was swung. Also, the uniformity of the oxide film thickness was improved by making the stroke of the swing of the substrate 6 larger than the repeating interval C of the light transmitting window 4a. (See the specification of the present invention, page 23, lines 11 to 23).

Tolt describes "The substrate is permitted to rotate back-and-forth... ." Although Murakami (Fig. 7) shows that a substrate can rotate and move in parallel and transversal direction with respect to the gas flow (column 2, lines 36-59), the invention is a CVD apparatus having gas nozzles 4-1 through 4-4 on the upper section, and is different from the light processing apparatus of the present application. Although Miller (Fig. 17) discloses that a chuck 120 linearly moves in a drive assembly 218, the invention is also a CVD apparatus having an injection assembly 160 on the upper section. Wertheimer (Figs. 1-4) is not a light processing apparatus, but a plasma processing apparatus using microwaves. This is clear as reference numeral 19 denotes a microwave window and not a light transmitting window.

As to the checkerboard pattern of the windows as recited in Claim 5, the thickness of the windows 4 can thereby be further reduced, as can the lengths of the light sources (p. 31, line 27 to p. 32, line 10). The Office Action has relied on the "lattice pattern" mentioned at

col. 8 of the Sakuma et al references, but this only refers to the arrangement of the support frame for the *single* window thereof. Thus this feature is not taught in the prior art.

Dependent Claims 3-4 and 22-23 further recite that the light transmitting windows are juxtaposed in the moving or swinging direction. The Office Action has noted that this can simply mean that they are placed side by side, but this arrangement nonetheless must be in the swinging or moving direction, and this is not taught, as discussed above.

Claim 12 was rejected under 35 U.S.C. § 103 as being obvious over the above references and further in view of Iwasaki and Maeda, which were cited to teach that it is desirable to place another chamber adjacent to a lamp processing chamber of the type taught by Sakuma. Although Iwasaki (5,174,881) discloses a CVD chamber adjacent to a preprocessing chamber having a mercury lamp 1, the pre-processing chamber does not comprise the structural elements of Claim 1. Although in Maeda (5,314,538), a wafer moves between multiple chambers, Maeda does not comprise the structural element of claim 1.

Claim 13 was rejected under 35 U.S.C. § 103 as being obvious over the above references, further in view of Takasu, Inayoshi or Iwasaki, each of which was cited to teach that a low pressure mercury lamp can be used for photochemical processing of a substrate held in a vacuum chamber. Similarly, Claims 14, 15 and 17 were rejected under 35 U.S.C. § 103 as being obvious over the above references in view of the admitted prior art of Figure 12. Claim 18 was rejected under 35 U.S.C. § 103 as being obvious over the above references in view of Beinglass. Claim 20 was rejected under 35 U.S.C. § 103 as being obvious over the above references in view of Iwasaki, Shinriki, Beinglass and Nakata.

Although the references to Takasu (5,261,961), Inayoshi (JP 2-182883) and Iwasaki (5,174,881) disclose using a low-pressure mercury lamp, the references do not comprise the structural elements of Claims 1, 2 and 16.

Beinglass (column 1, lines 18-39) discloses the technology of depositing a silicon doping layer using a CVD process in which a dopant gas (phosphine, arsine, etc.) is used, and the gas is heated by a high intensity lamps 138. However, Beinglass is not a light processing apparatus, and does not comprise the structural elements of Claims 1, 2 and 16.

Shinriki and Nakata (Asia Display/IDW '01) do not comprise the structural elements of Claims 1, 2 and 16.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

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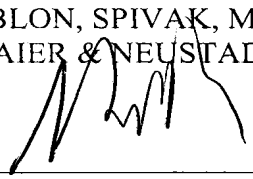

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